1. Remark/Discussion of Issues

Claims

By this Amendment, claim 1 has been revised to more clearly recite the claimed subject matter. Claims 1-13 are pending in the application, which Applicants respectfully submit are in condition for allowance.

35 U.S.C. § 103 Rejections – Claims 1-4, 6-9, 10 and 13

The Office Action of June 9, 2009, rejects claims 1-4, 6-9, 10 and 13 under 35 U.S.C. § 103(a) as being unpatentable over FOX et al. (U.S. Patent No. 5,974,657) in view of LENSSEN et al. (W00/79298). Applicants respectfully traverse the rejection because no proper combination of FOX et al. and LENSSEN et al. teaches or suggests every element of these claims.

Applicants rely at least on the following standards with regard to proper rejections under 35 U.S.C. § 103(a). A *prima facie* case of obviousness has three requirements. First, the prior art relied upon, coupled with the knowledge generally available in the art at the time of the invention, requires some reason that the skilled artisan would modify a reference or to combine references. *Princeton Biochemicals, Inc. v. Beckman Coulter, Inc.*, 411 F.3d 1332 (Fed. Cir. 2005). The Supreme Court has, however, cautioned against the use of "rigid and mandatory formulas" particularly with regards to finding reasons prompting a person of ordinary skill in the art to combine elements in the way the claimed new invention does. *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727 (2007). Second, the proposed modification of the prior art must have had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the same time the invention was made. In other words, a hindsight analysis is not allowed. *Amgen, Inc. v. Chugai Pharm. Co.*, 927 F.2d 1200 (Fed. Cir. 1991). Lastly, the prior art reference or combination of references must teach or suggest all the limitations of the claims. *In re Wilson*, 424 F.2d 1382 (C.C.P.A. 1970).

Applicants' silence on certain aspects of the rejection is by no means a concession as to their propriety. Rather, because the applied art fails to disclose at least one feature of the claims,

for at least the reasons discussed below, Applicants respectfully submit that the rejections are improper and should be withdrawn.

Claim 1

Claim 1 is directed to a method of manufacturing a device having a magnetic layer-structure, and recites as follows:

"... forming the magnetic layer-structure; heating the magnetic layer-structure with an electric current, the electric current comprising a current pulse having a duration such that no substantial heat transfer from the magnetic layer-structure to an environment of the magnetic layer-structure takes place, so that a temperature of the environment before and after the current pulse is substantially the same; and selecting a physical process of a plurality of physical processes having corresponding activation energies in the magnetic layer-structure based on the current pulse, a duration and an amplitude of the current pulse being adapted to an activation energy of the selected physical process."

As stated in Applicants' Amendment, filed March 20, 2009, regarding previous Office Action, mailed December 22, 2008, the current Office Action does not identify specific steps or elements of FOX et al. that specifically teach or suggest selecting a physical process in the magnetic layer-structure based on the current pulse or adapting a duration and an amplitude of the current pulse to an activation energy of the selected physical. Rather, the Office Action summarizes the language of eight claims (*i.e.*, claims 1-4, 6-8, 10) and cites two lengthy sections of FOX et al., without associating specific portions of these sections with the various claim features. *See* Office Action, pp. 2-3 (citing FOX et al., col. 3, lines 66-67, col. 4, lines 1-13, and col. 11, lines 7-50). Therefore, Applicants respectfully submit that the rejection fails to comply with MPEP § 706, which states, in part:

> The goal of examination is to clearly articulate any rejection early in the prosecution process so that the applicant has the opportunity to provide evidence of patentability and otherwise reply completely at the earliest opportunity (emphasis added).

The rejection likewise fails to comply with 37 CFR § 1.104(c)(2), which provides:

> In rejecting claims for want of novelty or for obviousness, the examiner must cite the best references at his or her command. When a reference is complex or shows or describes inventions other than that claimed by the applicant, the particular part relied on must be designated as nearly as practicable. The pertinence of each reference, if not apparent, must be clearly explained and each rejected claim specified (emphasis added).

Accordingly, the Examiner has not established a *prima facie* case of obviousness. Significantly, the current Office Action does not address this previously asserted argument, or otherwise identify portion(s) of FOX et al. (or newly asserted reference LENSSEN et al.) that specifically teach or suggest selecting a physical process in the magnetic layer-structure based on the current pulse or adapting a duration and an amplitude of the current pulse to an activation energy of the selected physical. Applicants thus again submit that the rejection of claim 1 under 35 U.S.C. § 103(a) should be withdrawn.

Moreover, the portions of FOX et al. cited by the Examiner (*i.e.*, col. 3, lines 66-67, col. 4, lines 1-13, and col. 11, lines 7-50) do not teach or suggest selecting a physical process of multiple physical processes having corresponding activation energies in the magnetic layer-structure based on the current pulse or adapting a duration and an amplitude of the current pulse to an activation energy of the selected physical. Rather, the cited portions of FOX et al. appear to disclose performance of only one physical process (on multiple layers): resetting magnetic moments of pinning/pinned layers and biasing layers, respectively. *See, e.g.*, col. 4, lines 7-13; col. 11, lines 36-46. In contrast, claim 1 recites selecting a physical process of multiple physical processes having corresponding activation energies. Examples of such physical processes include (but are not limited to) angle, resistance and crystalline state, as well as diffusion, rotation of magnetization, phase change transition, change of dopant concentration, etc. *See, e.g.*, Specification (published as U.S. Patent App. Pub. No. 2006/0127701), paras. [0071]-[0079]; [0086]- [0087]; FIGs. 7 and 8. Accordingly, FOX et al. does not disclose at least physical processes being selected or duration and amplitude of the

current pulse being adapted to an activation energy of the selected physical process, as recited in claim 1.

Although the Office Action nominally relies on LENSSEN et al. in combination with FOX et al. in rejecting claim 1, Applicants note that the Office Action does not apply any teachings of LENSSEN et al. to claim 1. Rather, the Office Action only addresses LENSSEN et al. in the context of rejecting previously allowed claims 9 and 13, stating in the entirety: "Regarding recitations of claims 9 and 13 that were indicated as allowable, since [LENSSEN et al.] teaches current change as changing physical processes (page 3, lines 10-23), such would have been obvious to one with ordinary skill in the art to include to Fox et al. to obtain the effective result desired." *See* Office Action, p. 3. Accordingly, Applicants submit that LENSSEN et al. does not cure the deficiencies of FOX et al., discussed above.

Therefore, Applicants respectfully submit that FOX et al. and LENSSEN et al., either alone or in any proper combination, do not teach or suggest every element of claim 1, and thus request withdrawal of the rejection of claim 1 under 35 U.S.C. § 103(a). Further, in light of the failure of the Office Action to comply with MPEP § 706 and 37 CFR § 1.104(c)(2), if further rejections are provided in subsequent official communications, Applicants respectfully submit that such rejections cannot be made properly final.

Claim 9

Claim 9 is directed to a method of manufacturing a magnetoresistive sensor device having a magnetic layer-structure, and recites as follows:

"... forming the magnetic layer-structure; and heating the magnetic layer-structure with an electric current, the electric current comprising a current pulse having a duration that prevents substantial heat transfer from the magnetic layer-structure to an environment of the magnetic layer-structure, so that a temperature of the environment before and after the current pulse is substantially the same, wherein the magnetic layer-structure comprises a first bias layer having a first antiferromagnetic material with a first blocking temperature and a second bias layer having a having a second antiferromagnetic material with a second

blocking temperature different from the first blocking temperature, a magnetization direction of the first or second antiferromagnetic material having the higher blocking temperature being set before a magnetization direction of the first or second antiferromagnetic material having the lower blocking temperature is set."

The Office Action asserts only that LENSSEN et al. teaches "current change as changing physical processes." *See* Office Action, p. 3 (citing page 3, lines 19-23). Initially, Applicants note that claim 9 does not specifically recite current changes as changing physical processes. Rather, claim 9 recites an electric current, which includes a current pulse having a duration that prevents substantial heat transfer from the magnetic layer-structure to an environment of the magnetic layer-structure. Further, the cited portion of LENSSEN et al. describes "induc[ing] a magnetic filed that 'sets' the exchange-biasing direction of the device in opposite directions, while the devices are heated above the blocking temperature of the exchange-biasing material R." *Id.* However, this description does not teach or suggest a first bias layer having a first antiferromagnetic material with a first blocking temperature and a second bias layer having a having a second antiferromagnetic material with a second blocking temperature different from the first blocking temperature, as recited in claim 9. To the contrary, it would appear that LENSSEN et al. refers to "devices" including the same "exchange-biasing material R" being heated above the same "blocking temperature," as opposed to different bias layers having different antiferromagnetic materials with different blocking temperatures, respectively.

Therefore, for at least the foregoing reasons, Applicants respectfully request withdrawal of the rejection of claim 9 under 35 U.S.C. § 103(a).

Claim 13

Claim 13 is directed to a method of manufacturing a magnetoresistive bridge device of a magnetic system comprising magnetoresistive bridge devices, and recites as follows:

"... forming a magnetic layer-structure; and heating the magnetic layer-structure with an electric current, the electric current comprising a current pulse having a duration that prevents substantial heat transfer from the magnetic layer-structure to an environment of the magnetic layer-structure, so that a temperature of the environment before and after the current pulse is substantially the same, wherein the current pulse is applied for offset compensation by irreversibly changing a resistance of at least one of the magnetoresistive bridge devices through local heating."

The Office Action asserts only that LENSSEN et al. teaches "current change as changing physical processes." *See* Office Action, p. 3 (citing page 3, lines 19-23). Initially, Applicants note that claim 13 does not specifically recite current changes as changing physical processes. Rather, claim 13 recites an electric current, which includes a current pulse having a duration that prevents substantial heat transfer from the magnetic layer-structure to an environment of the magnetic layer-structure, and which is applied for offset compensation by irreversibly changing a resistance of at least one of the magnetoresistive bridge devices through local heating. Further, the cited portion of LENSSEN et al. describes "induc[ing] a magnetic filed that 'sets' the exchange-biasing direction of the device in opposite directions, while the devices are heated above the blocking temperature of the exchange-biasing material R." *Id.* However, this description does not teach or suggest a current pulse being applied for offset compensation by irreversibly changing a resistance of at least one of the magnetoresistive bridge devices through local heating, as recited in claim 13.

Therefore, for at least the foregoing reasons, Applicants respectfully request withdrawal of the rejection of claim 13 under 35 U.S.C. § 103(a).

Claims 2-4, 6-8 and 10

Claims 2-4, 6-8 and 10 depend, directly or indirectly, from claim 1, and are therefore allowable for at least the reasons discussed with respect to claim 1, as well as in view of their additional recitations. Accordingly, the rejection of claims 2-4, 6-8 and 10 under 35 U.S.C. §103(a) should be withdrawn.

35 U.S.C. § 103 Rejections – Claims 5, 11, 12

The Office Action of June 9, 2009, rejects claim 5 under 35 U.S.C. § 103(a) as being unpatentable over FOX et al. in view of VOEGELI et al. (U.S. Patent No. 5,974,757), and rejects claims 11 and 12 under 35 U.S.C. § 103(a) as being unpatentable over FOX et al. in view of KUIPER et al. (WO 00/79298). *See* Office Action, pp. 3-4. Applicants respectfully traverse the rejections because no proper combination of FOX et al. and VOEGELI et al. teaches or suggests every element of claim 5, and no proper combination of FOX et al. and KUIPER et al. teaches or suggests every element of claims 11 and 12, respectively.

Claim 5

Claim 5 depends from claim 1, and is therefore allowable for at least the reasons discussed above with respect to claim 1, as well as in view of its additional recitations. Further, the Examiner relies on VOEGELI et al. only to disclose a sequence of current pulses. *See* Office Action, pp. 3-4. Therefore, VOEGELI et al. does not cure the deficiencies of FOX et al. discussed above. Accordingly, the rejection of claim 5 under 35 U.S.C. § 103(a) should be withdrawn.

Claims 11 and 12

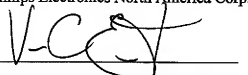
Claims 11 and 12 depend indirectly from claim 1, and are therefore allowable for at least the reasons discussed with respect to claim 1, as well as in view of their additional recitations. Further, the Examiner relies on KUIPER et al. only to disclose multiple devices including a Wheatstone bridge configuration. *See* Office Action, p. 4. Therefore, KUIPER et al. does not cure the deficiencies of FOX et al., discussed above. Accordingly, the rejection of claims 11 and 12 under 35 U.S.C. § 103(a) should be withdrawn.

CONCLUSION

In view of the foregoing explanations, Applicants respectfully request that the Examiner reconsider and reexamine the present application, allow claims 1-13 and pass the application to issue. In the event that there are any outstanding matters remaining in the present application, the Examiner is invited to contact Van C. Ernest (Reg. No. 44,099) at (571) 283-0720 to discuss these matters.

Respectfully submitted on behalf of:

Philips Electronics North America Corp.



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